[49 FR 43431, Oct. 26, 1984; 50 FR 695, 696, Jan. 4, 1985, as amended at 51 FR 23703, June 30, 1986; 55 FR 33440, Aug. 15, 1990]

APPENDIX D TO PART 136—PRECISION AND RECOVERY STATEMENTS FOR METHODS FOR MEASURING METALS

Twenty-eight selected methods from ''Methods for Chemical Analysis of Water and Wastes,'' EPA–600/4–79–020 (1979) have been subjected to interlaboratory method validation studies. The following precision and recovery statements are presented in this appendix and incorporated into part 136:

Method 202.1

For Aluminum, Method 202.1 (Atomic Absorption, Direct Aspiration) replace the Precision and Accuracy Section with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water and a natural water or effluent of the analyst's choice. The digestion procedure was not specified. Results for the reagent water are given below. Results for other water types and study details are found in ''USEPA Method Study 7, Analyses for Trace Methods in water by Atomic Absorption Spectroscopy (Direction Aspiration) and Colorimetry'', National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB86–208709/AS, Winter, J.A. and Britton, P.W., June, 1986.

For a concentration range of 500–1200 µg/L

$X=0.979(C)+6.16$
$S=0.066(X)+125$
$SR=0.086(X)+40.5$

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 206.4

For Arsenic, Method 206.4 (Spectrophotometric-SDDC) add the following to the Precision and Accuracy Section:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water and a natural water or effluent of the analyst's choice. Results for the reagent water are given below. Results for other water types and study details are found in ''USEPA Method Study 7, Analyses for Trace Methods in Water by Atomic Absorption Spectroscopy (Direct Aspiration) and Colorimetry'', National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB86–208709/AS, Winter, J.A. and Britton, P.W., June, 1986.

For a concentration range of 20–292 µg/L

$X=0.850(C)-0.25$
$S=0.198(X)+5.93$
$SR=0.122(X)+3.10$

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 213.1

For Cadmium, Method 213.1 (Atomic Absorption, Direct Aspiration) replace the Precision and Accuracy Section with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water and a natural water or effluent of the analyst's choice. The digestion procedure was not specified. Results for the reagent water are given below. Results for other water types and study details are found in ''USEPA Method Study 7, Analyses for Trace Methods in Water by Atomic Absorption Spectroscopy (Direct Aspiration) and Colorimetry'', National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB86–208709/AS, Winter, J.A. and Britton, P.W., June, 1986.

For a concentration range of 14–78 µg/L

$X=0.919(C)+2.97$
$S=0.108(X)+5.08$
$SR=0.120(X)+0.89$

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 218.1

For Chromium, Method 218.1 (Atomic Absorption, Direct Aspiration) replace the Precision and Accuracy Section with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water and a natural water or effluent of the analyst's choice. The digestion procedure was not specified. Results for the reagent water are given below. Results for other water types and study details are found in ''USEPA Method Study 7, Analyses for Trace Methods in Water by Atomic Absorption Spectroscopy (Direct Aspiration) and Colorimetry'', National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB86–208709/AS, Winter, J.A. and Britton, P.W., June 1986.

For a concentration range of 74–407 μg/L

$X=0.976(C)+3.94$
$S=0.131(X)+4.26$
$SR=0.052(X)+3.01$

where:

C=True Value for the Concentration, μg/L
X=Mean Recovery, μg/L
S=Multi-laboratory Standard Deviation, μg/L
SR=Single-analyst Standard Deviation, μg/L

Method 220.1

For Copper, Method 220.1 (Atomic Absorption, Direct Aspiration) replace the Precision and Accuracy Section with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water and a natural water or effluent of the analyst's choice. The digestion procedure was not specified. Results for the reagent water are given below. Results for other water types and study details are found in ''USEPA Method Study 7, Analyses for Trace Methods in Water by Atomic Absorption Spectroscopy (Direct Aspiration) and Colorimetry'', National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB86–208709/AS, Winter, J.A. and Britton, P.W., June, 1986.

For concentration range 60–332 μg/L

$X=0.963(C)+3.49$
$S=0.047(X)+12.3$
$SR=0.042(X)+4.60$

where:

C=True Value for the Concentration, μg/L
X=Mean Recovery, μg/L
S=Multi-laboratory Standard Deviation, μg/L
SR=Single-analyst Standard Deviation, μg/L

Method 236.1

For Iron, Method 236.1 (Atomic Absorption, Direct Aspiration) replace the Precision and Accuracy Section with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water and a natural water or effluent of the analyst's choice. The digestion procedure was not specified. Results for the reagent water are given below. Results for other water types and study details are found in ''USEPA Method Study 7, Analyses for Trade Methods in Water by Atomic Absorption Spectroscopy (Direct Aspiration) and Colorimetry'', National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB86–208709/AS, Winter, J.A. and Britton, P.W., June, 1986.

For concentration range 350–840 μg/L

$X=0.999(C)-2.21$
$S=0.022(X)+41.0$
$SR=0.019(X)+21.2$

where:

C=True Value for the Concentration, μg/L
X=Mean Recovery, μg/L
S=Multi-Laboratory Standard Deviation, μg/L
SR=Single-analyst Standard Deviation, μg/L

Method 239.1

For Lead, Method 239.1 (Atomic Absorption, Direct Aspiration) replace Precision and Accuracy Section with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water and a natural water or effluent of the analyst's choice. The digestion procedure was not specified. Results for the reagent water are given below. Results for other water types and study details are found in ''USEPA Method Study 7 Analyses for Trace Methods in Water by Atomic Absorption Spectroscopy

(Direct Aspiration) and Colorimetry''; National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB86–208709/AS, Winter, J.A. and Britton, P.W., June, 1986.

For concentration range of 84–367 µg/L

X=0.961(C)+13.8
S=0.028(C)+33.9
SR=0.011(X)+16.1

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 243.1

For Manganese, Method 243.1 (Atomic Absorption, Direct Aspiration) replace Precision and Accuracy Section with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water and a natural water or effluent of the analyst's choice. The digestion procedure was not specified. Results for the reagent water are given below. Results for other water types and study details are found in ''USEPA Method Study 7, Analyses for Trace Methods in Water by Atomic Absorption Spectroscopy (Direct Aspiration) and Colorimetry'', National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB86–208709/AS, Winter, J.A. and Britton, P.W., June, 1986.

For concentration range 84–469 µg/L

X=0.987(C)−1.27
S=0.042(X)+8.95
SR=0.023(X)+4.90

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 289.1

For Zinc, Method 289.1 (Atomic Absorption, Direct Aspiration) replace the Precision and Accuracy Section with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory-Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water and a natural water or effluent of the analyst's choice. The digestion procedure was not specified. Results for the reagent water are given below. Results for other water types and study details are found in ''USEPA Method Study 7, Analyses for Trace Methods in Water by Atomic Absorption Spectroscopy (Direct Aspiration) and Colorimetry'', National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB86–208709/AS, Winter, J. A. and Britton, P. W., June, 1986.

For concentration range 56–310 µg/L

X=0.999(C)+0.033
S=0.078(X)+10.8
SR=0.049(X)+1.10

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 202.2

For Aluminum, Method 202.2 (Atomic Absorption, Furnace Technique) replace the Precision and Accuracy Section statement with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory-Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques), ''National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 0.46 − 125 µg/L

X=1.1579(C) − 0.121
S=0.4286(X) − 0.124
SR=0.2908(X) − 0.082

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 204.2

For Antimony, Method 204.2 (Atomic Absorption, Furnace Technique) replace the Precision and Accuracy Section statement with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory-Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual as modified by this method. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 10.50 − 240 µg/L
X=0.7219(C) − 0.986
S=0.3732(X)+0.854
SR=0.1874(X) − 0.461

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 206.2

For Arsenic, Method 206.2 (Atomic Absorption, Furnace Technique) add the following to the existing Precision and Accuracy statement:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory-Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 9.78 − 237 µg/L
X=0.9652(C)+2.112
S=0.1411(X)+1.873
SR=0.0464(X)+2.109

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 208.2

For Barium, Method 208.2 (Atomic Absorption, Furnace Technique) add the following to the existing Precision and Accuracy information:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 56.50–437 µg/L
X=0.8268(C)+59.459
S=0.2466(X)+6.436
SR=0.1393(X) − 0.428

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 210.2

For Beryllium, Method 210.2 (Atomic Absorption, Furnace Technique) replace the existing Precision and Accuracy statement with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31,

Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 0.45–11.4 μg/L
X=1.0682(C)−0.158
S=0.2167(X)+0.090
SR=0.1096(X)+0.061

where:

C=True Value for the Concentration, μg/L
X=Mean Recovery, μg/L
S=Multi-laboratory Standard Deviation, μg/L
SR=Single-analyst Standard Deviation, μg/L

Method 213.2

For Cadmium, Method 213.2 (Atomic Absorption, Furnace Technique) add the following to the existing Precision and Accuracy information:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring System Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 0.43–12.5 μg/L
X=0.9826(C)+0.171
S=0.2300(X)+0.045
SR=0.1031(X)+0.116

where:

C=True Value for the Concentration, μg/L
X=Mean Recovery, μg/L
S=Multi-laboratory Standard Deviation, μg/L
SR=Single-analyst Standard Devision, μg/L

Method 218.2

For Chromium, Method 218.2 (Atomic Absorption, Furnace Technique) add the following to the existing Precision and Accuracy Section:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 9.87–246 μg/L
X=0.9120(C)+0.234
S=0.1684(X)+0.852
SR=0.1469(X)+0.315

where:

C=True Value for the Concentration, μg/L
X=Mean Recovery, μg/L
S=Multi-laboratory Standard Deviation, μg/L
SR=Single-analyst Standard Devision, μg/L

Method 219.2

For Cobalt, Method 219.2 (Atomic Absorption, Furnace Technique), replace the Precision and Accuracy Section statement with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 21.10−461 μg/L
X=0.8875(C)+0.859
S=0.2481(X)−2.541
SR=0.0969(X)+0.134

where:

C=True Value for the Concentration, μg/L
X=Mean Recovery, μg/L
S=Multi-laboratory Standard Deviation, μg/L
SR=Single-analyst Standard Deviation, μg/L

Method 220.2

For Copper, Method 220.2 (Atomic Absorption, Furnace Technique) replace the Precision and Accuracy Section statement with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 0.30 – 245 µg/L
X=0.9253(C)+0.010
S=0.2735(X) – 0.058
SR=0.2197(X) – 0.050

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 236.2

For Iron, Method 236.2 (Atomic Absorption, Furnace Technique) replace the Precision and Accuracy Section statement with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 0.37 – 455 µg/L
X=1.4494(C) – 0.229
S=0.3611(X) – 0.079
SR=0.3715(X) – 0.161

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 239.2

For Lead, Method 239.2 (Atomic Absorption, Furnace Technique) add the following to the existing Precisions and Accuracy Section:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 10.40 – 254 µg/L
X=0.9430(C) – 0.504
S=0.2224(X)+0.507
SR=0.1931(X) – 0.378

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 243.2

For Manganese, Method 243.2 (Atomic Absorption, Furnace Technique) replace the Precision and Accuracy Section statement with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL—CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below.

Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 0.42–666 µg/L
X=1.0480(C)+1.404
S=0.2001(X)+1.042
SR=0.1333(X)+0.680

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 249.2

For Nickel, Method 249.2 (Atomic Absorption, Furnace Technique) replace the Precision and Accuracy Section statement with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL—CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 26.20–482 µg/L
X=0.8812(C)+2.426
S=0.2475(X)+1.896
SR=0.1935(X)+1.315

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 270.2

For Selenium, Method 270.2 (Atomic Absorption, Furnace Technique) add the following to the existing Precision and Accuracy Section:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL—CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 10.00–246 µg/L
X=0.9564(C)+0.476
S=0.1584(X)+0.878
SR=0.0772(X)+0.547

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L
SR=Single-analyst Standard Deviation, µg/L

Method 272.2

For Silver, Method 272.2 (Atomic Absorption, Furnace Technique) add the following to the existing Precision and Accuracy Section:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL—CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 0.45–56.5 µg/L
X=0.9470(C)+0.181
S=0.1805(X)+0.153
SR=0.1417(X)+0.039

where:

C=True Value for the Concentration, µg/L
X=Mean Recovery, µg/L
S=Multi-laboratory Standard Deviation, µg/L

SR=Single-analyst Standard Deviation, μg/L

Method 279.2

For Thalliu, Method 279.2 (Atomic Absorption, Furnace Technique) replace the Precision and Accuracy Section statement with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 10.00–252 μg/L.
X=0.8781(C)−0.715
S=0.1112(X)+0.669
SR=0.1005(X)+0.241

where:

C=True Value for the Concentration, μg/L
X=Mean Recovery, μg/L
S=Multi-laboratory Standard Deviation, μg/L
SR=Single-analyst Standard Deviation, μg/L

Method 286.2

For Vanadium, Method 286.2 (Atomic Absorption, Furnace Technique) replace the Precision and Accuracy Section statement with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 1.36–982 μg/L.
X=0.8486(C)+0.252
S=0.3323(X)−0.428
SR=0.1195(X)−0.121

where:

C=True Value for the Concentration, μg/L
X=Mean Recovery, μg/L
S=Multi-laboratory Standard Deviation, μg/L
SR=Single-analyst Standard Deviation, μg/L

Method 289.2

For Zinc, Method 289.2 (Atomic Absorption, Furnace Technique) replace the Precision and Accuracy Section statement with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL-CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 0.51–189 μg/L.
X=1.6710(C)+1.485
S=0.6740(X)−0.342
SR=0.3895(X)−0.384

where:

C=True Value for the Concentration, μg/L
X=Mean Recovery, μg/L
S=Multi-laboratory Standard Deviation, μg/L
SR=Single-analyst Standard Deviation, μg/L

[55 FR 33442, Aug. 15, 1990]

PART 140—MARINE SANITATION DEVICE STANDARD

Sec.

AUTHORITY: 33 U.S.C. 1322, as amended.